

# APPENDIX 20

## **Basis and Rationale for Modification of Surface Water, Ground Water, and Floodplain Protection Buffer Zones**

In order to specify conditions whereby modifications to ground water protection buffers might be permitted on BLM managed floodplains and wetlands, it is necessary to establish what is meant by floodplains and wetlands in the context of legislation, and what values BLM is mandated to preserve by legislation.

### **Floodplain, Springs, and Wetland Values**

- Wetlands are generally distinguished by the vegetation they support, which is sustained by a high water table and an interactive surface-ground water regime. Wetlands may include stream riparian areas, floodplains, wet meadows, spring and seep riparian areas, areas surrounding reservoirs, ponds, and lakes, etc. Wetlands are important for water quality, wildlife habitat, water retention and storage, and flow regulation. Wetlands of all types in upper watersheds are the most important factor for maintaining perennial stream flow.

- Floodplains are areas subject to wetting by flows in excess of stream channel capacity. Floodplains can be but are not necessarily wetlands. The vegetation on floodplains is often associated with a high water table. Vegetation helps regulate high flows, providing increased retention time for surface to ground water infiltration, and decreasing downstream floodstage. Floodplains are critical recharge zones for streams, and are vital physical components of channels. This is true whether a channel has continuous perennial surface flow, interrupted perennial surface flow, continuous intermittent flow, interrupted intermittent flow, or even ephemeral flow. (While not normally found, the presence of floodplains on an ephemeral channel is a strong indicator that the channel has degraded). While infiltration rates are frequently lower, ephemeral channels can also have direct flowpaths to ground water storage reservoirs of larger intermittent and perennial channels. Therefore, the distinction in values between ephemeral and non-ephemeral streams is not clear-cut. Water quality issues remain similar regardless of temporal flow regime. Indeed, channel erosion is more difficult to manage in ephemeral channels due to the lack of bank stabilizing riparian vegetation. When floodplains are not functioning properly, the associated stream channel is destabilized and subject to excessive bank erosion. As alluded to, the aerial extent of surface protection which a stream system requires to protect floodplain function and prevent water pollution is not fixed, but varies from stream to stream. The perimeter of a channel is normally saturated at some shallow depth beneath the surface, if not to the surface. How far this saturated zone extends varies by watershed, however the function is similar for all drainage systems (whether ephemeral, perennial, or otherwise). This saturated zone represents a direct hydrologic connection between surface and ground waters in a stream channel. If a stream is ephemeral, it means the water table (if any) is normally below the rooting depths of natural vegetation. If it is perennial, it means the water table is normally high enough to support native vegetation. During snowmelt and precipitation events, the water table extends laterally as well as vertically. The greatest lateral extent of saturation by the water table is the actual distance which must be protected alongside streams. This width is established by the wet season water table, is not arbitrary, and may be determined by physical measurements. The area occupied by the wet season water table is an area which is particularly vulnerable to water quality contamination, because a spill on the surface could quickly enter the ground water reservoir along the channel and spread rapidly downstream. Underground leaks which occur within the zone of the wet season water table would quickly spread downstream. Springs have similar water tables, however these are generally shaped differently. Rather than being linear along a stream, the saturated areas surrounding springs often include a large portion of the recharge zone, upslope of the spring. The discharge points of springs often form headwater tributaries of stream channels, therefore the downslope sides of springs often have a linear water table following the channel as in a stream. Regardless of shape, the water tables surrounding springs have similar water quality values to address. Determining the minimum buffer zone required to protect a given spring via physical measurements is possible, but often more complicated than for a stream channel.

Values such as critical wildlife habitat, density of archeological sites, and water rights (diversion points) are also important considerations within riparian zones.

- 1) Surface occupancy or permanent disturbance of wetlands should not be permitted. Modifications to this should not be considered.
- 2) Facilities located within the buffer zones of streams and springs must be isolated from surface and ground water flows.
  - a) The surface must be isolated from run-on. Overland flows from snow melt or precipitation must be diverted around the site and returned as dispersed overland flow, not as channelized flow, in such a manner as to prevent erosion.
  - b) All liquids must be isolated on the site, including precipitation.
  - c) The site must be isolated from ground water. Spills cannot be allowed to percolate into ground water.
- 3) Designs for facilities requiring modifications to must be submitted to BLM PFO and reviewed by appropriate staff specialists, including the hydrologist, riparian specialist, and and others as warranted, prior to approval.

### **Ground Water Protection Stipulation**

Riparian areas – Surface disturbing activity is prohibited in non-functioning or functioning at risk riparian habitat. Surface disturbing activities may be permitted in properly functioning riparian areas provided functioning condition is not degraded. Such activity is predicated upon other applicable resource protection conditions being met as determined by BLM.

Wetlands – Surface disturbing activities is prohibited in wetlands, including wet meadows, as determined by BLM.

Stream channel beds - Surface disturbing activities are to be avoided on the land area overlying the wet-season water table of all stream channels as determined by physical investigation, the 100 year floodplain as mapped by FEMA or other sources to be verified by BLM, or 330 feet perpendicular to the centerline of intermittent and perennial, (including interrupted intermittent and perennial streams), whichever is appropriate for the situation. This may include channels which are in a degraded condition at the time of the proposed activity, but which have the potential to sustain a water table typical of intermittent and perennial streams. If the flow regime of a channel cannot be readily determined, the channel would be considered as having a water table above the channel bed, i.e. intermittent or perennial.

Springs - Surface disturbing activities are to be avoided on (1) the land area encompassed by a 660 foot radius from a spring discharge point, or (2) the recharge area of the spring as determined by physical investigation, in addition to a specified distance (to be determined on a case-by-case basis) from the discharge point.